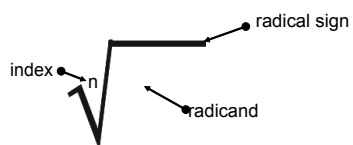


5.5 Roots of Real Numbers



Simplify

$$\sqrt{36} = 6 \text{ principal root}$$

Solve

$$\sqrt{x^2} = \sqrt{36}$$

$$x = \pm 6$$

$$\sqrt{75} \rightarrow \begin{matrix} 25 & 3 \\ \swarrow & \searrow \\ 5 & 5 \end{matrix} \rightarrow 5\sqrt{3}$$

$$\sqrt{24} \rightarrow \begin{matrix} 4 & 6 \\ \swarrow & \searrow \\ 2 & 2 \end{matrix} \rightarrow 2\sqrt{6}$$

$$\sqrt{32} \rightarrow \begin{matrix} 16 & 2 \\ \swarrow & \searrow \\ 4 & 4 \end{matrix} \rightarrow 4\sqrt{2}$$

$$\sqrt[3]{27} = 3$$

$$\sqrt[3]{27} \rightarrow \begin{matrix} 27 \\ \swarrow \quad \searrow \\ 9 \quad 3 \\ \swarrow \quad \searrow \\ 3 \quad 3 \end{matrix}$$

$$\sqrt{16x^3} \rightarrow \begin{matrix} x^3 \\ \swarrow \quad \searrow \\ x \quad x \end{matrix} \rightarrow 4\sqrt{x^3} \rightarrow 4x\sqrt{x}$$

$$-\sqrt{9x^6} = -3x^3$$

$$\pm \sqrt{(q^3 + 5)^4}$$

$$\pm (q^3 + 5)^2$$

$$\sqrt[4]{x^8 y^{12} z^4}$$

$$x^2 y^3 z$$

$$\sqrt[3]{-27p^6}$$

$$-3p^2$$

$$\begin{array}{c} 243 \\ \wedge \\ 9 \quad 27 \\ \wedge \quad \wedge \\ 3 \quad 3 \quad 3 \quad 9 \\ \quad \quad \quad \wedge \\ \quad \quad \quad 3 \quad 3 \\ \quad \quad 3^5 \end{array}$$

$$\sqrt[5]{243a^{10}b^3}$$

$$3a^2 \sqrt[5]{b^3}$$

$$\sqrt{-4}$$

not \mathbb{R}

$$\sqrt[3]{-8}$$

$$-2$$

$$\sqrt[6]{t^7}$$
$$t \sqrt[6]{t}$$

HW

p248

31, 43, 49, 30-54 x3 (Multiples of 3)